EXHIBIT F

IN THE UNITED STATES DISTRICT COURT

FOR THE WESTERN DISTRICT OF TEXAS

WACO DIVISION

rose hills,	§	
Plaintiff	§	
	§	
v.	§	**CIVIL ACTION NO. 6:18-cv-301-ADA**
	§	
SAM'S EAST, INC., SAM'S CLUB, and WAL-MART, INC., formerly known as WAL-MART STORES, INC.,	§	
Defendants	§	

STATE OF TEXAS

COUNTY OF TRAVIS

BEFORE ME, the undersigned authority on this day personally appeared Dr. Hector Miranda-Grajales, MD, CLCP, known to me to be a credible person over the age of 18 years, who being by me first duly sworn, did depose and say that the following is true and correct:

1. "My name is Dr. Hector Miranda-Grajales. I am over eighteen (18) years of age, I have never been convicted of a felony, and I am competent to testify. I was retained in this matter in my professional capacity through Medical Injury Rehabilitation Specialists to assess the life care needs of Ms. Rose Hills and to provide an appropriate life care plan. My opinions are based upon a reasonable degree of medical and rehabilitation certainty, regarding the projected future medical and medically related goods and services that Rose Hills will need as a result of the injuries she sustained as a result of the trip and fall incident on October 13, 2016, and the associated cost of these goods and services. The facts to which I testify herein are within my personal knowledge or, if they are facts provided to me, are of the type reasonably relied upon by experts in my field in formulating opinions such as those that I state in my report. I swear under penalty of perjury that my testimony in this affidavit is true.

2. I am qualified to render opinions regarding the medical and medically related goods and services that Rose Hills will probably need

as a result of her injuries sustained on October 13, 2016, and the cost of those goods and services. A true and correct copy of my CV is attached hereto as Exhibit 1. Everything on that CV is true, and I adopted it as my testimony under oath in this affidavit. I am a medical doctor who is Board Certified in Brain Injury Medicine, Board Certified in Pain Management, and Board Certified in Physical Medicine and Rehabilitation. I am a Certified Life Care Planner. I have prepared over 250 life care plans in my career, many of which have been for people with traumatic cervical spine injuries and post-traumatic headaches similar to the injuries sustained by Rose Hills. I have been a medical doctor for 13 years. I also have over 4 years of experience preparing life care plans and long range medical projections for persons with medical conditions similar to Rose Hills.

3. I am qualified to examine a patient and offer opinions about treatment of a patient, such as Ms. Rose Hills. I am a medical doctor specializing in Physical Medicine and Rehabilitation, Pain Management and Brain Injuries. I have extensive experience treating patients with cervical spine pain and headaches similar to Rose Hills. Through my medical education, training and experience, I have acquired specialized knowledge about the properties of the human spine, diseases of the spine and the neural elements within the spine, head pain and headaches, as well as diagnosis, treatment and prognosis of injuries and diseases of the spine and head. I used this specialized knowledge in formulating my opinions that Rose Hills' ongoing neck pain, radicular symptoms, and posttraumatic headaches are directly related to the fall in question.

4. I utilized my knowledge, skill, education, experience, and training when reviewing Ms. Hills' medical records since the fall sustained on October 13, 2016, at Sam's Club, when reviewing Ms. Hills' prior medical records to adequately rule out other potential causes or alternative explanations for her injuries, when performing my physical examination on her, and conducting my interview with her. Notably, while her records indicated a prior history of migraines, after I reviewed all the records in this case, including any prior records, I am of the opinion, in agreeance with her treating neurologist, that Rose Hills does suffer from Post Traumatic Headaches resulting from her neck injury sustained in the fall. Based on my knowledge, skill, education, experience and training, I am able to evaluate what injuries she sustained when making my diagnosis, as well as what future care plan I believe she will require. As a medical doctor and certified life care planner, I compare, when possible, the objective findings with a patient's subjective complaints to determine a course of treatment, diagnosis, and causation. Here, I utilized the medical records and my examination to try to identify objective findings, which then correlated with the subjective complaints provided by Ms. Hills, to both

her treating physicians as well as to me. These opinions are all made within a reasonable degree of medical certainty. I then determine the cost by utilizing industry custom databases which are regularly relied upon by life care planners.

5. I have ascertained the need for and reasonable cost of present and future medical care goods and services for my patients over the years, and I have referred many patients to other specialists for treatment based on my assessment of those needs. Through the course of my education, training and experience, I have acquired specialized knowledge, beyond that possessed by a layman, about the properties of the human body, including the spine, headaches and the brain, the effects of various modalities of treatment for injuries to the spine, and the need for such modalities of treatment to cure and relieve the effects of injuries like Rose Hills. I used this specialized knowledge in formulating the opinions contained in the Life Care Cost Analysis for Rose Hills that I prepared.

6. The methodology of the determination of future medical needs that I used to formulate my Life Care Plan for Ms. Hills in this case was identical to the methodology I use when providing advice to insurance companies regarding an insured's probable future medical needs.

7. This methodology involves reviewing and analyzing the patient's medical records and history; conducting a comprehensive interview, evaluation and examination of the patient; if necessary, conducting any case-specific research of the medical literature that is necessary under the circumstances; and then applying my specialized knowledge (including that gained by any case-specific research) to the data to make a prediction of the medical and medically related goods and services that the patient will probably need. Then, to determine the probable cost of the future goods and services that I have determined the patient will probably need, I consult a recognized, widely-accepted database and other cost data sources that I consider the most reliable sources available to represent usual and customary fees and costs in a specific geographic domain and the marketplace generally. I specifically utilize Fairhealth.org for medical care costs and Goodrx.com for prescription costs. Since my deposition given in this case, to better be able to articulate more specific information regarding Fairhealth.org, I have done some research. *See the attached website screenshots regarding Fairhealth.org attached hereto as Exhibit 3.* These cost data sources are the kinds that are reasonably relied upon by most life care planners and similar professionals. By applying the cost data provided in these databases and other cost data sources for the region in which the patient resides, we can calculate within a reasonable degree of certainty the usual and customary cost of the goods and services needed by the patient. The

use of databases such as Fairhealth.org is consistent with the tenets and methodology of life care planners and "Standards of Practice" established by the International Academy of Life Care Planners.

8. This is exactly the methodology I applied in developing the Life Care Plan for Ms. Hills in this case. This methodology provided me with more than adequate factual foundation for developing the life care cost analysis for Ms. Hills. Indeed, I develop such cost analyses in both the litigation and non-litigation contexts based on this very type of underlying factual data.

9. With respect to Ms. Hills, I performed a comprehensive interview, evaluation and examination. In addition to the interview and in-person assessment, I also reviewed the incident report relaying Ms. Hills fall at the Sam's Club parking lot, her medical records from Baylor Scott and White dated 10/13/16, 10/17/16, 10/18/16, 10/31/16-8/14/17, 11/29/17-4/8/19, Physical Therapy records from 11/14/16-1/6/17, and medical records from Comprehensive Injury Treatment Services from 10/21/16-1/9/17, medical records from Pain Specialist of Austin for 2/24/17. I also, since my initial record review, have reviewed prior medical records from Baylor Scott & White predating the fall at Sam's Club dated 8/21/2008-6/23/16. After conducting the examination and interview of Ms. Rose Hills and reviewing the medical records from the above-listed healthcare providers, I developed opinions regarding the life care needs Ms. Hills would require due to the injury she reported she sustained as a result of the October 13, 2016, trip and fall incident. My opinions, and the respective bases for them are set forth in the life care plan attached hereto as Exhibit 2, as well as my deposition testimony."

Dr. Hector Miranda-Grajales, MD, CLCP

State of Texas, County of Dallas

SWORN TO AND SUBSCRIBED before me on the 7th day of February, 2020.

Notary Public, State of Texas by Dr. Hector Miranda-Grajales MD, CLCP

My commission expires: 04/26/2022

Robert E. Hardie

Robert E Hardie

NOTARY PUBLIC STATE OF TEXAS

ROBERT E. HARDIE

ID NUMBER
11509129
COMMISSION EXPIRES
APRIL 26, 2022

Notarized online using audio-video communication

Exhibit 1

CURRICULUM VITAE
HÉCTOR A. MIRANDA-GRAJALES, MD, FAAPM&R, CLCP

March 2019

4201 Bee Caves Rd.,
Suite C-213
West Lake Hills, TX 78746-6458

email:
hmirandamd@mdclcp.net
hmirandamd@medinjury.net
Office: (512) 960-4717
Fax: 855-868-9882

LANGUAGES SPOKEN

- English
- Spanish

MEDICAL LICENSES:

- Florida: ME107880
- Texas: Q4469
- New York: 262463-1
- California: C149232

CERTIFICATONS

- Board Certified in Brain Injury Medicine
  - December 1, 2016 – December 31, 2026
  - Certificate Number: 385
- Certified Life Care Planner (CLCP)
  - September 2015
  - Certified by the University of Florida, College of Public Health & Human Professions, Department of Behavioral Science & Community Health
- Board Certified in Pain Medicine
  - August 18, 2012 – December 31, 2022
  - Certificate Number: 1521
- Diplomate of American Board Physical Medicine and Rehabilitation
  - 7/1/2012 – 12/31/2022

- Certificate Number: 10537

PROFESSIONAL EXPERIENCE

September 3, 2013 –

- Founded Medical Injury Rehabilitation Specialists, LLC
  - Medical Director and interventional pain management physician of this practice

    - 4201 Bee Caves Road, Suite C-213, West Lake Hills, TX 78746
    - 4611 NW 53rd Avenue, Gainesville, FL 32653
    - 404 Hall of Fame Drive, Lake City, FL 32055

- August 27, 2012 – August 26, 2013
  - Interventional pain management physician at the Institute of Pain Management

    - 1325 San Marco Blvd. Suite 4A, Jacksonville, FL, 32207; tel: 904- 306- 9860 fax: 904-306-9864; Business address: PO Box 57970 Jacksonville, FL 32241-7970
    - 4243 Sunbeam Rd., Jacksonville, FL, 32207; tel: 904-264-5661
    - 1210 Kingsley Ave., Orange Park, FL 32073; tel: 904-264-5661

EDUCATION

August 3, 2003 – June 15, 2007 University of Puerto Rico School of Medicine, Rio Piedras, Puerto Rico.

- M.D.
- Graduation June 15, 2007.
- Graduated *magna cum laude*.

August 16,1999- February 16, 2003 University of Puerto Rico, Rio Piedras.

- B.S. General Sciences.
- Graduated February 16, 2003.
- Graduated *magna cum laude*.

POSTGRADUATE TRAINING

July 1, 2011-June 30, 2012

- Fellowship training in Anesthesia ACGME accredited Pain Management at Beth Israel Medical Center in New York City, NY.

July 1, 2008-June 30, 2011

- Residency training in Physical Medicine and Rehabilitation atthe University of Miami Miller School of Medicine.

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- Internship in Internal Medicine at the Veterans Affairs Medical Center in San Juan, Puerto Rico.

HONORS/AWARDS/ACHIEVEMENTS

Residency

April 23, 2010

- Named Chief Resident of PM&R residency program.

Undergraduate

2002-03

- Who's who among students in United States colleges and universities.

1999-03

- Dean's List.
- Honor Roll student at University of Puerto Rico, Rio Piedras.

POSTERS & PUBLICATIONS

2013

- **Miranda-Grajales H.**, Hao J, Cruciani R. False Sense of Safety by Daily QTc Interval Monitoring During Methadone IVPCA Titration in a Patient with Chronic Pain. *Journal of Pain Research;* May 2013;6 375-378.

PROFESSIONAL ASSOCIATION MEMBERSHIPS

2015

- Member of American Medical Association
- Member of Texas Medical Association
- Member of American Academy of Physical Medicine & Rehabilitation
- Member of the International Association of Rehabilitation Professionals

Exhibit 2

MD Certified
LIFE CARE PLANNER

Life Care Plan

Rose Hills

DOB: 08/12/81
Date of Report: 07/14/19

MD Certified Life Care Planner

4201 Bee Caves Road
Suite C-213
West Lake Hills, TX 78746

512-960-4717

Total Cost of LCP without Occipital Nerve Blocks: $713,802

Total Cost of LCP with Occipital Nerve Blocks: $1,261,770

MD Certified
LIFE CARE PLANNER

Client: Rose Hills

Date of Report: 07/14/19

DOI: 10/13/16

Life Expectancy: 48 years.

Date of Evaluation: 7/11/19

Location of Evaluation:
4201 Bee Caves Rd, Suite C-213, West Lake Hills, TX 78746

Report completed by: Dr. Hector Miranda-Grajales, MD, CLCP

Introduction

A life care plan is a dynamic document based upon published standards of practice, comprehensive assessment, data analysis, and research, which provides an organized, concise plan for current and future needs with associated costs for individuals who have experienced catastrophic injury or have chronic health care needs. (International Academy of Life Care Planners, 2003. Established during the 2000 Life Care Planning Summit). A life care plan is designed, among many things, to help reduce medical complications and provide the best possible care for the unique needs of the particular patient involved.

The opinions, diagnoses, and conclusions mentioned in this report are based within a reasonable degree of rehabilitation and medical certainty. These opinions are based on my clinical experience as well as my training in physical medicine and rehabilitation, pain management, and life care planning. They are also based on the history provided, records reviewed, and examination findings. I reserve the right to modify my opinion should new information be made available to me.

Independent Medical Examination (IME) Report For Life Care Plan

In regards to: Rose Hills (examinee and patient)
Date of Birth: **8/12/81**
Date of Loss: **10/13/16**
Examiner: Hector Miranda-Grajales, MD
Specialty: Physical Medicine & Rehabilitation/Interventional Pain Management/Life Care Planner
Date of IME: **7/11/19**

Questionnaire

Home address: 1814 Buckskin Trl, Temple, TX 76502

Cell phone number: 254-421-0014

Age: 37

Race: Hispanic

Sex: Female

Dominant hand: Right

Work history: Hair stylist.

Prior accidents: She was involved in a car accident in 1999; she did not have chronic headaches or pain after that accident; she did not treat with a chiropractor, physical therapist, pain doctor, or surgeon after that accident. She was involved in another accident in 2000 or 2001. She was taken to the hospital by ambulance and was discharged home the same day. She developed lower back and right hip pain that resolved with chiropractic care. She did not have aggravated headaches after that accident. She did not treat with physical therapy, pain management, or surgeon after that accident. In 2002 she was assaulted and was punched in the nose and went to the ER. She did not have aggravated headaches, neck or back pain after that assault. She has not been assaulted, injured in a car accident, or in another slip and fall incident since the slip and fall of 10/13/16.

Has the patient ever had any disability prior to the accident in question?

Can the patient drive a car? Yes.

Sleeping habits: She wakes up at night with neck pain and headaches.

Social Activities: She reports with Emgality injections she can function more.

Activities of Daily Living: She is independent in ADLs.

Disclaimer

The examinee was informed that today's examination was to evaluate specific conditions pertinent to the accident in question; hence, information provided would not be confidential. Prior to the physical examination the patient was instructed not to perform any maneuver that might cause injury or exacerbation of symptoms, and to advise the examiner to avoid or immediately abort any such test.

Records Summary

Date	Provider	Note Type	Summary
10/13/16	-	Incident report	Mrs. Hills fell at the parking lot.
10/13/16	Baylor Scott & White	Progress note	She treated for whiplash injury, shoulder pain, neck pain.
10/17/16	Baylor Scott & White	Progress note	She treated for neck and wrist pain.
10/18/16	Baylor Scott & White	Progress note	She treated for neck and left wrist pain.
10/21/2016 - 1/9/17	Comprehensive Injury Treatment Services	Billing records	As of 10/21/16 she reported headaches.
10/31/2016 - 8/14/17	Baylor Scott & White	Progress note	She treated for neck pain and headaches.
11/14/2016 - 1/6/17	PT	Progress note	She treated for neck pain and headaches.
2/24/17	Pain Specialists of Austin	Progress note	She treated for pain in: neck, left shoulder, and left arm. She was diagnosed with cervical radiculopathy and a cervical ESI was recommended.
4/8/2019 - 11/29/17	Baylor Scott & White	Progress note	Mrs. Hills treated for post-traumatic headaches and neck pain. Her cervical MRI showed disc protrusions in: C5-6, C7-T1, T1-2.

Summary

HPI: Mrs. Hills is a 37 y/o woman who was injured in a slip and fall accident on 10/13/16 at Sam's Club parking lot. She did not hit her head. She landed on her hands and knees. She did not hurt at the time of the fall. She went home that day and when she woke up she "could not move her neck." She then went to the ER the same day of the slip and fall due to neck pain and headaches. She eventually developed numbness in her left 4th and 5th digits that persists to today. She treated with a chiropractor, but this treatment did not provide long term relief. She treated at Pain Specialists of Austin. Her pain doctor recommended injections of her neck. However, she has glaucoma and her ophthalmologist advised against doing any kind of steroid injections "because I can go blind." She did not proceed with cervical steroid injections.

Note, she was on gabapentin, but this did not help. She had an adverse reaction to Lyrica, she was "seeing things" while on that medication. Robaxin did not help much either. She is treating with Dr. Cabret for her headaches. She started Emgality injections for her migraines. She had a

history of headaches prior to the fall, since her mid 20s, but those headaches were resolved with over the counter medications and were not nearly as frequent and severe as they have become since the fall of 10/13/16.

Her post-traumatic headaches started after the fall of 10/13/16. They are constant; intensity: 6-9/10; her room is "blacked out" because bright lights make her headaches worse (also worsened with noise, and certain smells); she reports that Emgality, a prophylactic headache medication, helps bring down her headaches to 6/10. Without the Emgality, she would throw up from the nausea, and would be dizzy. Prior to taking Emgality she was taking anti-emetic medications daily, and now she only takes them once a week. She cannot take triptans because they make her drowsy. She takes Nortriptyline to sleep better. She takes dihydroergotamine 4mg/mL sprays for severe headaches at least twice a week. The headaches are throbbing, stabbing, shooting, tension-like. They're located on the back of her head and shoot to the front.

Her neck pain is constant; quality: throbbing, burning; it shoots down the left arm; intensity: 5-9/10; not associated with spasms; worsened with neck motion.

Review of Systems: as above.

Medications: Dihydroergotamine 4mg/mL sprays twice a week, Emgality 120mg/ml once a month, Reglan 10mg once a week, birth control, eye drops for glaucoma, Nortriptyline 40mg at night.

PMH: Glaucoma.

PSH: Tubal ligation.

Allergies: NKDA.

FH: Mother: diabetic, hypertension (alive); father: alive, has hypertension.

Social History: She does not smoke cigarettes or drink alcohol.

Physical Exam:

Constitutional: Patient is A & O X 3, normal in appearance, attention to hygiene and body habitus, in no apparent distress and coherent and cooperative.

Eyes: Examination of eyes reveals normal eyelids and conjunctivae; normal irises.

ENT/Mouth: Normal external ears and nose; normal hearing

Cardiovascular: no edema in extremities; palpable pedal pulses

Respiratory: normal respiratory effort

MSK:

ROM: Limited cervical ROM on extension and rotation due to pain.

Palpation: Tenderness to palpation in cervical paraspinal muscles.

Strength: 5/5 in upper and lower extremities.

Sensation: Intact to light touch in upper and lower extremities.

DTRs: 2+ in upper and lower extremities.

Neuro: Cranial nerves intact.

Analysis Of Findings

Diagnoses: The patient suffers from the following conditions, which are causally related to the slip and fall of 10/13/16:

1. Post-traumatic headaches.
2. Post-traumatic cervical radiculopathy.
3. Post-traumatic disc herniations in: C5-6, C7-T1, T1-2.

Clinical Status: It is within a reasonable degree of medical certainty that the patient's impairments are permanent.

Itemized Records

1. Pain Specialists of Austin - Records
2. BSW - bills
3. BSW - records
4. BSW - Supplement
5. CVS - meds
6. HEB - pt expense
7. Incident report
8. Plaintiff's First Amended Comp
9. Plaintiff's R.26 Initial Disclosures
10. Pltf's First Amended Disclosures
11. Rose Hills - deposition
12. Walmart - meds 2
13. Walmart - meds

Cost Sources

1. Fair Health Online database was used to calculate medical services. The rates for care and services are from the claimant's geographical area.
2. Source for medications: Goodrx.com

Geozip: 76502 Year of benchmarks FAIR HEALTH: April 2019

Future care without ONBs

Item	Frequency	CPT	Rate
Neurology	3x per year	99214	$ 212
*Dihydroergotamine	4mg/mL sprays twice a week	-	$5,190 per year.
Emgality 120mg/pen	1 per month	-	$8,280 per year.
Reglan	10mg once a week	-	$4 per year.
Nortriptyline	40mg qhs	-	$207 per year.
Cervical MRI	1x every 5 years	72141	$ 2,954

*One spray has 0.5mg; it is sprayed twice in each nostril (2mg per use). 1 vial has 3.5 mL (14 mg per vial). At twice a week, she is using 4mg/week or 208 mg/year (52*4=208). She will need 15 (208/14=15) vials per year. $346 per vial. $5,190 per year.

Future care with ONBs

Item	Frequency	CPT	Rate
Neurology	3x per year	99214	$ 212
Bilateral greater and lesser occipital nerve blocks (ONB)	2x per year	64405x2, 64450x2	$ 5,708
Dihydroergotamine	4mg/mL sprays twice a week	-	$5,190 per year.
Emgality 120mg/pen	1 per month	-	$8,280 per year.
Reglan	10mg once a week	-	$4 per year.
Nortriptyline	40mg qhs	-	$207 per year.
Cervical MRI	1x every 5 years	72141	$ 2,954

Item	CPT	Rate
Greater ONB	64405	$1,708
Lesser ONB	64450	$1,146

Hector A. Miranda-Grajales, M.D., C.L.C.P.
Diplomate of American Board of Physical Medicine and Rehabilitation
Board Certified Pain Management Specialist
Board Certified in Brain Injury Medicine
Certified Life Care Planner

Life Care Plan Tables

A life expectancy was obtained from the National Vital Statistics Report Volume 67, Number 7, November 13, 2018. Table 12, According to this source, Rose Hills's life expectancy is 48 years. The expected age of death is 85 years old.

DOB: 8/12/1981
AGE: 37
RACE: Hispanic

Client Name: Rose Hills
Date of Injury: 10/13/2016
Gender: Female

Projected Evaluations

Primary Disability: Post-traumatic headaches, cervical radiculopathy.

Date of Preparation: 7/14/19

Item	Frequency and Duration of Need			Average Cost	Average Annual Cost	Years of Duration	Average Total Cost	Age At Start	Age At End	Comment
	Units	Every	# Years							
LCP	1	X	48	$ -	$ -	48	$ -	37	85	
Totals				$ -	$ -		$ -			-

Projected Evaluations Average Unit Cost Total: $
Projected Evaluations Average Annual Cost Total: $
Projected Evaluations Average Cost Total: $

Projected Treatment - without ONBs

DOB: 8/12/1981
AGE: 37

Client Name: Rose Hills
Date of Injury: 10/13/16
Date of Preparation: 07/14/19

Primary Disability: Post-traumatic headaches, cervical radiculopathy.

The expected age of death is 85 years old.

Item	Frequency and Duration of Need			Average Cost	Average Annual Cost	Years of Duration	Average Total Cost	Age At Start	Age At End	Comment
	Units	Every	# Years							
Neurology	3	X	1	$ 212.00	$ 636.00	48	$ 30,528.00	37	85	
Dihydroergotamine	1	X	1	$ 5,190.00	$ 5,190.00	48	$ 249,120.00	37	85	
Emgality	1	X	1	$ 8,280.00	$ 8,280.00	48	$ 397,440.00	37	85	
Reglan	1	X	1	$ 4.00	$ 4.00	48	$ 192.00	37	85	
Nortriptyline	1	X	1	$ 207.00	$ 207.00	48	$ 9,936.00	37	85	
Cervical MRI	1	X	5	$ 2,954.00	$ 590.80	48	$ 26,586.00	37	85	
Totals				$ 16,847.00	$ 14,907.80		$ 713,802.00			

Projected Treatment - without ONBs Average Unit Cost Total: $ 16,847.00
Projected Treatment - without ONBs Average Annual Cost Total: $ 14,907.80
Projected Treatment - without ONBs Average Cost Total: $ 713,802.00

Projected Treatment - with ONBs

DOB: 8/12/1981
AGE: 37

Client Name: Rose Hills
Date of Injury: 10/13/16
Date of Preparation: 07/14/19

Primary Disability: Post-traumatic headaches, cervical radiculopathy.

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Item	Frequency and Duration of Need			Average Cost	Average Annual Cost	Years of Duration	Average Total Cost	Age At Start	Age At End	Comment
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Neurology	3	X	1	$ 212.00	$ 636.00	48	$ 30,528.00	37	85	
ONBs	2	X	1	$ 5,708.00	$ 11,416.00	48	$ 547,968.00	37	85	
Dihydroergotamine	1	X	1	$ 5,190.00	$ 5,190.00	48	$ 249,120.00	37	85	
Emgality	1	X	1	$ 8,280.00	$ 8,280.00	48	$ 397,440.00	37	85	
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Cervical MRI	1	X	5	$ 2,954.00	$ 590.80	48	$ 26,586.00	37	85	
Totals				$ 22,555.00	$ 26,323.80		$ 1,261,770.00			

Projected Projected Treatment - with ONBs Average Unit Cost Total: $ 22,555.00
Projected Projected Treatment - with ONBs Average Annual Cost Total: $ 26,323.80
Projected Projected Treatment - with ONBs Average Cost Total: $ 1,261,770.00

CURRICULUM VITAE
HÉCTOR A. MIRANDA-GRAJALES, MD, FAAPM&R, CLCP

March 2019

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EDUCATION

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- Graduation June 15, 2007.
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- Named Chief Resident of PM&R residency program.

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1999-03

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- Honor Roll student at University of Puerto Rico, Rio Piedras.

POSTERS & PUBLICATIONS

2013

- **Miranda-Grajales H.**, Hao J, Cruciani R. False Sense of Safety by Daily QTc Interval Monitoring During Methadone IVPCA Titration in a Patient with Chronic Pain. *Journal of Pain Research;* May 2013;6 375-378.

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CASE REPORT

False sense of safety by daily QTc interval monitoring during methadone IVPCA titration in a patient with chronic pain

Hector Miranda-Grajales
Joy Hao
Ricardo A Cruciani

Department of Pain Medicine and Palliative Care, Beth Israel Medical Center, New York, NY, USA

Abstract: It has been proposed that some deaths attributed to methadone are related to prolongation of the QTc interval; however, there are no clear recommendations on electrocardiogram (ECG) monitoring in patients undergoing intravenous methadone infusion. This is a report on a patient receiving methadone intravenous patient-controlled analgesia titration for the treatment of chronic pain. Initially, her daily ECGs showed QTc intervals within normal limits; however, she experienced a rapid increase in QTc interval from 317 ms to 784 ms within a 24-hour period after methadone had been discontinued for excessive sedation. QTc interval greater than 500 ms is considered to be high risk for the fatal arrhythmia Torsades de Pointes. Daily ECGs did not detect a gradual increase in the QTc interval that would have alerted the medical staff of the need to decrease or stop the methadone before reaching a prolonged QTc interval associated with cardiotoxicity. In selected cases where aggressive methadone titration is required, more intensive monitoring, such as telemetry or ECG determinations every 12 hours, might help detect changes in QTc interval duration that might otherwise be missed by daily ECG determinations.

Keywords: methadone, QTc prolongation, opioids, opioid side effects, IVPCA methadone

Background

The use of methadone for the management of chronic pain has increased in the last decade, as has the number of the deaths attributed to its use.[1] Methadone is a chiral mixture with a variable metabolization rate[2] that contributes to its unpredictable half-life (ranging between 15 and 150 hours), which can lead to drug accumulation and potential cardiac toxicity.[1] Methadone and other opioids, including oxycodone,[3] can block delayed potassium rectifying currents (I_{Kr}), thus interfering with the repolarization of the conductive tissue of the heart[4] and predisposing to Torsade de Pointes (TdP), a fatal ventricular arrhythmia. On electrocardiogram (BCG), prolonged depolarization manifests as QTc interval prolongation.[5] An acceptable QTc interval upper limit has been proposed to be 430 and 450 ms for males and females,[6] respectively, while values beyond 500 ms are considered to be high risk for TdP irrespective of sex.[6]

Although the use of intravenous (IV) methadone in the terminally ill population is considered to be safe,[7] and the QTc prolongation reported by Kornick et al was attributed to the preservative chlorobutanol,[8] many reports suggest that methadone itself may prolong the QTc interval in a dose-dependent manner.[4] Furthermore, coadministration of certain medications may increase the risk of cardiotoxicity, for example, drugs that have the potential to prolong the QTc interval,[9] such as certain antibiotics or antiarrhythmic agents, or drugs that may compete with methadone as substrates for the cytochrome P450 isoenzymes 3A4, 2D6, and 2B6,[10] such as certain antidepressants, resulting in

Correspondence: Ricardo A Cruciani
10 Union Square East, Suite 2Q-2R, Department of Pain Medicine and Palliative Care, Beth Israel Medical Center, New York, NY 10003, USA
Tel +1 212 844 1390
Fax +1 212 844 6962
Email rcrucian@chpnet.org

elevated methadone plasma levels. To address the risk of cardiotoxicity, some authors have advocated serial ECGs to monitor the QTc interval duration,[11] but the recommendations on frequency of monitoring and medication dose at which the ECG should be done are controversial[12] and range from "ECG is never necessary" to perform ECG "in every patient."[13]

Objective

To promote awareness that daily ECG monitoring during IV patient-controlled analgesia (PCA) with methadone may not be sufficient to anticipate a rapid prolongation of the QTc interval.

Methods and findings

The patient was a 50-year-old woman with chronic abdominal pain for over 10 years due to lupus vasculitis who during hospitalization for opioid rotation, experienced QTc prolongation beyond 500 ms during rapid IV methadone titration in less than 24 hours. The patient's pain had not been managed to satisfaction as an outpatient, and admission for IV opioid titration was recommended. At the time of admission to the Pain Service Inpatient Unit, Beth Israel Medical Center, New York, NY, USA, the patient's medications included morphine sulfate 150 mg intramuscular (IM) every 4 hours and meperidine 75 mg IM every 8 hours, and her pain score was 10/10. During hospitalization, the patient underwent trials with intravenous patient controlled analgesia (IVPCA) hydromorphone, morphine, and fentanyl, which did not alleviate the pain or cause significant side effects and had to be discontinued. Afterwards, the patient received IV methydlprednisolone and ketamine infusion, and both were ineffective. After a baseline ECG that showed a QTc interval of 449 ms, an IVPCA methadone trial was initiated. The 12-lead ECG was obtained with a MAC 5000 machine (GE Medical Systems, Milwaukee, WI, USA). The QT interval was measured manually by a board-certified cardiologist. The interval was corrected for heart rate using the Bazett formula:[6]

$$QTc = QT/Sqrt\ [RR].$$

QTc prolongation was defined as intervals longer than 430 ms for males and 450 ms for females.[14] During the first 7 days of methadone IVPCA titration, the QTc interval duration ranged from 416 to 449 ms (Table 1). On the morning of day 8, the QTc interval was 317 ms (Table 1). That night, due to excessive sedation, the IVPCA methadone was discontinued, so the patient received only 184 mg during the 24-hour period. During this episode, the patient was easily aroused; oriented to self, time, and space; had stable vital signs (BP 134/82; HR 62; RR 12); and had no evidence of arrhythmia (although an ECG was not done). The next morning, a repeat ECG showed a QTc interval of 784 ms (12 hours after the methadone IVPCA had been discontinued). At that point, the sedation was resolved, there was no evidence of withdrawal symptoms, and the electrolytes were within the normal range (K^+ 4.3, Ca^{2+} 9.3, Mg^{2+} 2.0, aspartate aminotransferase (ALT) 17, alanine aminotransferase (AST) 16 for a reference range of 3.7–5.2 mEq/L, 8.5–10.9 mg/dL, 1.7–2.2 mg/dL, 8–37 IU/L, and 10–34 IU/L respectively). The patient remained on nortriptilyne 25 mg in the morning and afternoon and 50 at bed time (plasma level of 81 for a therapeutic range of 70–170 ng/mL), and baclofen 10 mg every 8 hours that she had been taking at the same dose for several months before this admission. It is worth noting that no new medications that could prolong the QTc interval or interfere with methadone metabolism were initiated at this admission, (for a list of medications that can prolong the QTc interval, visit http://www.torsades.org). Twenty-four hours later, the QTc interval duration was 476 ms, and the patient reported a pain score of 8/10. At this time, methadone was resumed as an oral formulation at half the dose of that before discontinuation (30 mg three times a day), which is a dose that had not caused significant QTc interval prolongation a few days earlier. In addition, the patient received hydromorphone 8–16 mg IV every 3 hours as needed to provide additional pain relief and to control withdrawal symptoms. This combination of medications provided inadequate pain relief, as the patient reported pain scores ranging from 6/10 to 10/10.

On day 15, in view of the poor response obtained with IV and oral opioids (the patient continued to report pain scores of 10/10), methadone was discontinued, and a trial of neuroaxial analgesia that included hydromorphone, bupivacaine, clonidine, baclofen, and midazolam was conducted. At day 21, the patient continued reporting pain scores that ranged between 8/10 and 10/10, and the neuroaxial analgesia trial was discontinued. At this point, oral methadone was titrated, up to 30 mg four times a day, and the patient also received transdermal fentanyl 300 µg/hour every 72 hours (dose based on the IVPCA fentanyl trial that the patient had had earlier during this hospitalization). Hydromorphone 8–16 mg every 3 hours as needed was continued to manage breakthrough pain and withdrawal symptoms. On day 24, the patient was discharged on methadone and transdermal fentanyl, with the addition of meperidine IM and morphine IM, which the patient had used for many years, but now at lower doses and with longer intervals between administrations. At discharge, her pain score was 4/10 and the QTc interval

Table 1 Methadone dose over time and daily ECG

Day of IVPCA	Methadone			QTc interval duration (ms)
	Total methadone oral dose (mg/24 h)	IVPCA methadone dose (continuous rate plus demand, mg/24 h) and conversion to PO equivalency dose (IV to PO conversion factor = 2)	Total methadone dose in PO equivalent (mg/24 h)	
Day 1	40	28.8 × 2 = 57.6	97.6	449
Day 2	60	58.8 × 2 = 117.6	177.6	445
Day 3	60	94.8 × 2 = 189.6	249.6	430
Day 4	60	151.6 × 2 = 303.2	363.2	426
Day 5	60	121 × 2 = 242	302	416
Day 6	60	126.9 × 2 = 253.8	313.8	420
Day 7	60	137.3 × 2 = 274.6	334	429
Day 8	60	62 × 2 = 124 (12 h)	184	317
Day 9	20	–	20	784
Day 10	120	–	120	476
Day 11	120	–	120	486
Day 12	120	–	120	477
Day 13	120	–	120	495
Day 14	120	–	120	471
Day 15	None	–	0	485
Day 16	None	–	0	432
Day 17	None	–	0	451
Day 18	None	–	0	418
Day 19	None	–	0	437
Day 20	None	–	0	421
Day 21	30	–	30	404
Day 22	60	–	60	443
Day 23	90	–	90	448
Day 24	90	–	90	467

Notes: QTc duration versus total methadone dose. The first ECG was done to obtain a QTc interval duration baseline. Thereafter, daily ECGs were obtained to monitor the duration of the QTc while the IVPCA methadone titration was conducted. The total methadone dose was defined as the addition of the constant infusion rate, the demand dose, and the IV equivalent oral dose, in 24-hour periods. The methadone IV to oral conversion ratio was 1:2.
Abbreviations: ECG, electrocardiogram; IV, intravenous; PCA, patient-controlled analgesia; PO, per oral.

was 437 ms. We recognize that meperidine IM long-term use is not recommended, and the potential buildup of the metabolite normeperidine can cause seizures. However, the patient expressed anxiety at the prospect of discontinuing this medication, which she had been taking for many years without experiencing significant side effects. Therefore, we developed a plan to gradually switch from the use of injectable meperidine to injectable morphine, with eventual plan to transition to oral medications. After discharge, the patient was evaluated weekly in an outpatient setting for 1 month, at the end of which her pain score was 4/10, and the QTc interval was 372 ms. Four months later, the overall injectable mediations had been reduced by an additional 25% and her QTc interval duration was 410 ms.

Discussion

An ECG is a good screening tool for cardiac arrhythmias;[14] however, in this case, daily ECGs were not sufficient to guide dosing during rapid methadone titration as a gradual prolongation of the QTc interval was not observed. Instead, the QTc interval jumped from what is considered to be low risk for cardiotoxicity to over 700 ms in less than 24 hours, putting the patient at high risk for fatal arrhythmias such as TdP. Since the methadone was preservative-free, and medications that can be substrates of the cytochrome P450 isoenzymes 3A4, 2D6, and 2B6, or those that can block the I_{kr}, were not initiated during this hospitalization, it is likely that the observed prolongation was due to a dose-dependent effect of methadone on the QTc interval caused by drug accumulation. In this report, daily ECGs did not detect a gradual increment of the QTc interval duration that would have guided clinical decisions to either decrease or stop the drug before the QTc interval exceeded 500 ms. Therefore, while daily ECGs may be useful, this should not be the only method used to guide clinical decisions regarding dose adjustments of methadone, as a normal QTc interval can give a false sense of safety.

Telemetry monitoring or ECG determinations every 12 hours should be considered in cases in which aggressive titration of IV methadone is elected. However, since methadone plasma levels were not measured in this case, the conclusions of this report cannot be generalized.

Disclosure

Ricardo A Cruciani is on the speaker board for ENDO, Covidien, and Pfizer; has been coinvestigator in research funded by Ameritox; has organized CME courses funded by Grupo Ferrer; and has been in the advisory board for Depomed and Janssen Pharmaceuticals. The authors report no other conflicts of interest in this work.

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Dr. Miranda-Grajales Testimony Experience

EW = Expert Witness; TP = Treating Physician LCP = Life Care Plan

	Depos	Date	Location	Court style	Case#	Name of c	Retained b	Payments recei	Insurance comp	Defense at	Was it videographed?
1.	EW	9/24/2013	4611 NW 53	Circuit court	12-2012-	Budnik, Ar	Tommy De	$1000 for the de	Statefarm	Jason Fanc	No
2.	TP	-	136 SW Nass	Circuit court,	11-327-C	Staley, Ran	Tommy De	$1000 for the de	Statefarm	-	No
3.	EW	9/2/2014	4611 NW 53	Circuit court	13-130-C	Bonesio, G	Tommy De	$1,000 for recor	Statefarm	Raymond F	No
4.	TP	2/24/2015	136 SW Nass	IN THE CIRCU	13-474-C	Proveaux,	Tommy De	$1,500 for 1 hou	-	Harris Brov	Yes
5.	EW	5/11/2016	4201 Bee Cav	-	M-2010(	Kenneth B	Carlson La	$3,000	Non-subscriber	Bill Ashcraf	Yes
6.	TP	5/26/2016	4202 Bee Cav	Circuit court	01-2014-	Brian Cohe	Defense: R	$1,000	-	Robert Tuc	No
7.	LCP	5/24/2016	4203 Bee Cav	IN THE DISTR	CAUSE N	Sharon Pre	Plaintiff: Ji	$3,275	-	Eric W. Hin	Yes
8.	EW	5/31/2016	4201 Bee Cav	-	M-2010(	Kenneth B	Carlson La	(I billed $1,750 f	Non-subscriber	Bill Ashcraf	Yes
9.	LCP	6/20/2016	Carlson Law Firm Office 11606 N IH			Melissa Bis	Carlson La	$2,500	-		yes
10.	TP	6/30/2016	4201 Bee Caves Rd, Suite C-213, We			Vanmeter,	Aaron Baker		-		yes
11.	LCP	9/8/2016	4201 Bee Cav	Distric Court	NO. 201	Edward Ya	Plaintiff; Jo	$10,500: $8,000	James Christopl	Nathan Ryc	Yes
12.	LCP	9/16/2016	111 Congress	District Court	CAUSE N	Roel Rodri	Defense: A	When I was beir	Plaintiff: Collen	Defense: A	Yes
13.	LCP	10/14/2016	Omni Hotel D	District Cour	NO. 201-	Bulmaro F	Plaintiff: E	$4,000 for life ca	SCS Constructio	J. Hans Bar	No
14.	LCP	11/11/2016	111 Congress	99th District	2014-51	William Jar	Plaintiff: C	$4,000 for life ca	C&D Waste Ltd.	Elliott V Nixon; CRENSHAW, DUPREE, & MILLAM	
15.	TP	2/7/2017	The Carlson I	District Cour	Cause No	Zafar Al-de	Plaintiff: Jo	My bill is $2,500	Joshua Holley	Robert House	
16.	EW-IM	3/31/2017	Thompson, C	District Cour	Cause No	Nancy Pete	Michael D	$1,500 for IME a	-	Christopher Rigler, Jennifer Aufricht	
17.	LCP	4/27/2017	1220 Colorad	IN THE 70TH	CAUSE N	Michael Da	Jonathan C	$5,000 for life ca	-	Christopher Slayton	
18.	EW-IM	1/3/2017	901 MoPac E	IN THE COUN	CAUSE N	Wendy Jo	Terrence D	$2,500 for depo	-	-	Yes
19.	LCP	7/26/2017	11606 N IH-3	IN THE DISTR	CAUSE N	Doyle "Ran	Todd Kelly	$6,500 for LCP; $	-	William Ch	No
20.	LCP	5/3/2017	1717 N IH-35	American Ari	Case No.	Corrin San	Rob Ranco	$7,650 for LCP; $	-	Mark Giltn	No
21.	LCP	8/18/2017	Wright & Gre	American Ari	Case No.	Corrin San	Rob Ranco	$7,650 for LCP; $	-	Mark Giltn	No
22.	LCP	9/25/2017	812 San Anto	IN THE DISTR	CAUSE N	James Scot	Parker Pol	$4,000 for LCP; $	-	Jeff Otto	
23.	LCP	9/21/2017	808 W Ave, A	IN THE DISTR	Cause No	Ricardo Ga	Justin Dem	$4,000 for LCP; $	-	-	No
24.	LCP	10/12/2017	11940 Jollyvi	IN THE DISTR	NO. D-1-	CHARISSA	Lee, Gobe	$4,000 for repor	-	Ryan Bueche, James Hicks	
25.	LCP	11/8/2017	Travis Count	IN THE DISTR	CAUSE N	James Scot	Parker Pol	$4,000 for LCP; $	-	Jeff Otto	
26.	LCP	12/5/2017	US LegalSupp	IN THE DISTR	CAUSE N	SANDRA A	Steve Dum	$5650 for LCP; $	-	Peter C. Bl	Yes
27.	LCP	1/12/2018	Veritext Lega	IN THE DISTR	CAUSE N	KATHLEEN	Darrell Kel	$10,750 for LCP	-	James Stou	No
28.	LCP	1/26/2018	701 Brazos S	AMERICAN A	No. 01-1	Debra Ball	Charles Ca	$6,830 for LCP r	-	Mark Carri	Yes
29.	EW	1/26/2018	Calle Resolud	US District Ca	Federal:	Janet Hern	Yadira Mar	$975 for phone	-	Doris Quin	No
30.	LCP	2/21/2018	Federal Cour	UNITED STA	Case 2:1	Grover Hal	Larry Ward	$8,200 for LCP; $		Michael R	Yes
31.	LCP	2/28/2018	Travis Count	IN THE DISTR	NO. D-1-	CHARISSA	Lee, Gobe	$4,000 for repor		Ryan Bueche	-

32.	LCP	3/8/2018	700 Brazos S	In the district	Cause No	Marshall S	Todd Kelly	$6750 for LCP; $	-	David Criss	-
33.	LCP	6/7/2018	100 Dolores	224th Dist Ct	Cause 20	Stephanie	Steven Du	$4,000 for LCP a	-		
34.	LCP	6/26/2018	11606 N Inte	In the district	Cause No	Agueda Cu	Scott Crive	$4,000 for LCP a	-	Douglas Gc	No
35.	EW	7/17/2018	248 Addie Ro	In the county	Cause No	Kendrick S	Jeff Villarre	$500 for a causa	State Farm	Edward F. I	Yes
36.	LCP	9/19/2018	701 Brazos S	In the district	CAUSE N	Stephen Be	Nielsen La	$4,000 for LCP; $	-	Alexandra	No
37.	LCP	9/26/2018	701 Brazos S	District Court	Cause No	Andrew Ra	Robert Ran	$5,000 for each	State Farm	Ron Clark	No
38.	LCP	10/24/2018	1502 W Ave.	District Court	CAUSE N	JOSEPH M	Joe Lopez	$6,200 for LCP a	KELLY-MOORE P	Jay R. Dow	No
39.	LCP	10/25/2018	7703 North L	District Court	CAUSE N	LELA MON	Michael Tu	$6,750 for LCP a	CHAE CHAI	MATT MOI	No
40.	LCP	11/28/2018	701 Brazos S	District Court	Cause No	Perry Den	Michael Br	$5,000 for LCP r	-	Ryan Roger	Yes
41.	LCP	1/9/2019	701 Brazos S	DISTRICT CO	CAUSE N	Jamil Jones	Geoffrey N	$6,200 for LCP a	-	Paul Garcia	Yes
42.	LCP	2/21/2019	701 Brazos S	DISTRICT CO	CAUSE N	GABRIEL R	Brian H. Cr	$4,000 for LCP a	HEB	D. Alan Erv	Yes
43.	LCP	2/26/2019	10 Market St	SUPREME CT	Index No	Dewakshi	Michael Le	$12,500 for LCP	Liberty Mutual	Marc Stei	No
44.	LCP	3/11/2019	701 Brazos S	UNITED STAT	Civil Acts	DOMENICA	Mark Perk	$ 12,500	-	Gregorio ,	Yes.
45.	LCP	3/25/2019	701 Brazos S	In the district	CAUSE N	Stephen Be	Nielsen La	$4,000 for LCP; $	-	Alexandra	No
46.	LCP	5/30/2019	405 Martin L	IN THE DISTR	CAUSE N	Beverly Ke	LINDSAY R	$4,000 for LCP;	-	KENNETH	-
47.	LCP	6/13/2019	7703 North L	IN THE DISTR	CAUSE N	DAVID MO	Christophe	$6,750 for LCP; $	GARRISON PRO	ROBERT F. SCHEIHING	
48.	LCP	6/21/2019	Court Report	JUDICIAL WO	JWA No	Edwin Veg	Juan C. He	$4,000; $2,500 f	-	Travis R. Br	Yes

Medical Injury
Rehabilitation
Specialists

Hector Miranda-Grajales, M.D.

4201 Bee Caves Rd., Suite C-213
West Lake Hills, TX 78746
Tel: 512-960-4717 / Fax: 855-868-9882

Date: 7/17/19

In accordance to the rules for Federal Court, section (vi) *statement of the compensation to be paid for the study and testimony in the case:*

I billed and collected $7,200 for the life care plan on Rose Hills. I will bill $2,500 for a deposition lasting 4 hours or less and $5,000 lasting more than 4 hours. I will bill $5,000 for trial.

Hector Miranda-Grajales, M.D.

Medical Injury Rehabilitaion Specialists

MIRS - Hector Miranda Grajales, MD
512-960-4717

4201 Bee Cave Rd
West Lake Hills, Texas
78746
United States

Bill To
Julie L. Peschel
Carlson Law Firm
2010 SW HK Dodgen Loop, Suite 201
Temple, TX
76504

Date of Issue
06/29/2019

Due Date
07/01/2019

Invoice Number
0000062

Amount Due (USD)
$0.00

Description	Rate	Qty	Line Total
Hills, Rose - LCP with rush fee Hills, Rose - LCP with rush fee	$7,200.00	1	$7,200.00

Subtotal	7,200.00
Tax	0.00
Total	7,200.00
Amount Paid	7,200.00
Amount Due (USD)	$0.00

Exhibit 3

About Us

FAIR Health is an independent nonprofit that collects data for and manages the nation's largest database of privately billed health insurance claims and is entrusted with Medicare Parts A, B and D claims data for 2013 to the present. We are known both for our commitment to transparency and for making actionable data available in innovative ways to all stakeholders in the healthcare community.

Created with the real-world needs of users in mind, our data products, tools and educational information support laws and regulations, catalyze business decisions, inform claims adjudication, fuel research, shape healthcare policy and meet the day-to-day cost-estimation needs of healthcare consumers.

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FAIR Health was established to bring transparency to healthcare costs and health insurance information. A conflict-free, nonprofit organization that qualifies as a public charity under section 501(c)(3) of the Internal Revenue Code, FAIR Health is charged with maintaining and making available trusted claims data resources that are used to promote sound decision making by all participants in the healthcare system.

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Reflecting the healthcare community we serve, our Board of Directors comprises leaders in medicine, healthcare policy, law, consumer advocacy, health insurance, education, health systems research and business. Mindful of our mission, they provide expertise and guidance to support the development of our data

FAIR Health's rich data repository and independence make us a valued resource for federal and state government agencies seeking reliable, objective data. The data serve a variety of purposes, from rate setting and economic studies to clinical analyses and population health research. Governmental uses of FAIR Health data include support of policy making, legislative initiatives, healthcare research, public health, insurance regulation, dispute resolution and consumer education. Our data are incorporated in statutes and regulations around the country and serve as the official data source for many state health programs.

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In keeping with our mission of bringing transparency to healthcare costs and insurance information, FAIR Health partners with prominent national and regional organizations on programs designed to improve health insurance literacy and decision making, and to promote groundbreaking research.

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FAIR Health's data products and analytics—built on a data collection representing the claims experience of the privately insured population and those covered by Medicare—are used with confidence by consumers and organizations throughout the healthcare sector. Our statisticians put our data through rigorous validation processes to ensure their integrity. The value we place on healthcare data privacy and security is evidenced by our HITRUST, SOC 2 and CMS Qualified Entity (QE) certifications. FAIR Health's commitment to our defining mission—the independence and transparency of healthcare data—is exemplary.

Privately billed medical and dental procedures

Privately insured individuals

493

Geozip regions

100%

All Medicare Parts A, B and D claims

Data Contribution

The ever-increasing size and scope of FAIR Health's data collection ensure that it continues to serve as a mirror of the healthcare marketplace. Our health insurance payor and third-party administrator (TPA) clients contribute their healthcare claims data from both self-insured and fully insured plans on

Validation

Not only do we have the database with the most healthcare claims, we also maintain its superior quality with trusted, reliable and representative data. FAIR Health's expert staff run the claims data we receive from our contributors through a comprehensive validation process to ensure the integrity of our database and the many widely used products it supports.

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Security

At a time when electronic security is a global concern, FAIR Health has earned the trust of many of the nation's largest health plans, which rely on us to store,

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FAIR Health employs a number of recognized statistical methodologies to aggregate claims data for use in our benchmarks. In fulfillment of our mission, we are transparent about the methods we use to organize data, which have been vetted by independent experts in healthcare economics and statistics.

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which can include on-site training.

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FAIR Health employs recognized statistical methodologies to create our FH® Benchmarks. In addition to our in-house staff of mathematicians and statistical and clinical experts, we consult with independent healthcare economists and statisticians—all leaders in their fields—to gain an external perspective on our methodologies. In fulfillment of our mission of transparency, we make our methodologies available to the public.

Creating Benchmark Products

To create FH Benchmarks, we organize the claims data we receive by procedure code and geographic area. We group our data into 493 geozips—geographic areas typically based on the first three digits of a zip code or group of zip codes. FAIR Health employs a statistical outlier methodology to exclude any extremely low and extremely high values that might otherwise distort the distribution of data. Most of our benchmarks are based on a recent 12-month window of claims. Our FH® Charge Benchmarks and FH® Allowed Medical are refreshed every six months; our other FH® Allowed Benchmarks are refreshed annually.

FH Charge Benchmarks Methodology

the actual charge amounts for each procedure code/geozip combination are arrayed from lowest to highest to determine percentiles. A percentile is a position in a distribution of values below which a specified percentage of the values fall. For example, in a distribution of 100 data points, the 70th percentile is the value in the 70th position in the lowest-to-highest array of values. Thus, 70 percent of the values are equal to or lower than the 70th percentile value and 30 percent are equal to or higher than the 70th percentile value.

Derived methodology. If the frequency of actual charges for a procedure in a geozip is insufficient, the charge benchmarks are derived by using the charges for all procedures in a procedure code group within the geozip. First, the charge amounts are "normalized" by dividing each charge by the code's relative value. Next, the results for all procedure codes in the group are arrayed from lowest to highest and assigned to percentiles, as described above. In the final step, the relationships between codes are re-established by multiplying the percentile values by each code's relative value. The derived methodology enables the creation of benchmarks for codes for which there are very few or no data.

FAIR Health is converting our FH Charge Benchmarks product line, which previously offered two lines of modules, one based on the actual methodology with the derived methodology used only for low-frequency codes and the other exclusively using the derived methodology for all codes. As a result of the conversion, which is being implemented in stages, eventually most charge benchmarks products will be offered solely based on the

FH Allowed Benchmarks are based on imputed values developed from ratios of allowed amounts to billed charges established for each procedure code group. The imputed amounts for high-frequency codes are arrayed and organized into percentiles for each procedure code/geozip combination to determine the allowed benchmarks. Allowed benchmarks for lower-frequency codes are derived based on a relative value and conversion factor methodology.

Learn more about the methodologies FAIR Health uses to create benchmarks.

We are transparent about the methodologies we use to create benchmarks.

Include Your Data in the Nation's Top Claims Resource

FAIR Health employs a number of recognized statistical methodologies to aggregate claims data for use in our benchmarks. In fulfillment of our mission, we are transparent about the methods we use to organize data, which have been vetted by independent experts in healthcare economics and statistics.

Licensing Credits and Other Benefits of Contribution

As a FAIR Health data contributor, your organization's experience will be represented in a database that is increasingly used by government agencies as an official data source for numerous health policy and consumer protection initiatives. Other benefits of contribution can include:

- Sizable discounts that reduce your licensing fees for FAIR Health data products;
- Eligibility for nonpublic reports, developed by FAIR Health in our capacity as CMS Qualified Entity, analyzing your data, de-identified Medicare data and information from our private claims repository;

advancing the movement toward cost transparency and clarity in healthcare reimbursement.

Full Scope of Claims Data for All Coverage Types

Contributors are asked to submit all data elements from all claims for the full range of services for which they provide coverage (e.g., professional, facility, dental). Our comprehensive data contribution program ensures that FAIR Health products are robust, mirror the market and enable our clients to make decisions based on data they trust.

Contact us to learn if you qualify to become a contributor.

Leave a Message

Add your experience to the database that is informing decisions about healthcare nationwide.

Enroll Now!

Enroll Now

Unmatched Data Assets Made Actionable for All Stakeholders

FAIR Health is dedicated to maximizing the productive use of our claims data—a resource that sets the industry standard for reliability, security and breadth.

Presenting a complete, regionally specific picture of healthcare cost and utilization in today's marketplace, our data collection includes:

- Billions of billed medical and dental procedures contributed by private insurers and administrators who insure or process claims for plans covering more than 150 million individuals; and
- Medicare Parts A, B and D claims data, received from the Centers for Medicare & Medicaid Services through our Qualified Entity certification, reflecting claims for all individuals across the country enrolled in traditional Medicare from 2013 to the present. (Claims data on Medicare Advantage enrollees are housed separately in our private claims data repository.)

needs.

Customized Support for Strategic Decision Making and Research

We license our privately billed charge and allowed data through a broad range of products—including FH® Benchmarks, FH® Custom Analytics, FH® Dashboards, region- and specialty-specific datasets and market indices—to researchers, insurers, businesses, government agencies, healthcare systems and others. Our data are used to provide insight into clinical developments and quality of care through longitudinal studies; shed light on trends in utilization, place of service and practice patterns; and much more.

Award-Winning Consumer Resources

Our data power free tools for consumers, available via the FAIR Health Consumer website and the FH® Cost Lookup/FH® CC Salud mobile app in English and Spanish, where consumers can estimate their healthcare expenses and take advantage of a rich educational platform. FAIR Health's consumer resources have been honored by numerous prominent organizations and publications.

A complete picture of healthcare cost and utilization in today's marketplace

Speak to a FAIR Health representative
1-855-301-FAIR (3247)
Monday through Friday
8 am to 6 pm ET

Contact Us Now